Paeonia anomala subsp. *veitchii* (Paeoniaceae), a New Combination

Hong Deyuan and Pan Kaiyu
Laboratory of Systematic and Evolutionary Botany, Institute of Botany, Chinese Academy of Sciences, Xiangshan, Beijing, 100093, People's Republic of China

Nicholas J. Turland
Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri 63166-0299, U.S.A.

ABSTRACT. A study of morphological characters of *Paeonia veitchii* Lynch, based on over 180 specimens, reveals that the following new combination is necessary: *P. anomala* L. subsp. *veitchii* (Lynch) D. Y. Hong & K. Y. Pan, comb. et stat. nov. The name is also lectotypified. Three previously recognized varieties of *P. veitchii* are here reduced to synonymy for the first time: *P. veitchii* var. *leiocarpa* W. T. Wang & S. H. Wang ex K. Y. Pan, *P. veitchii* var. *uniflora* K. Y. Pan, and *P. woodwardii* Stern & Cox.

Key words: China, *Paeonia*, Paeoniaceae.

Paeonia veitchii Lynch, endemic to China (Gansu, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, and Xizang), has been treated as an independent species since its original description in 1909 (Lynch, 1909; Stern, 1946; Fang, 1958; Anonymous, 1972; Pan, 1979). It is a variable entity in flower number per stem and leaf and carpel indumentum, and was treated as four varieties by Pan (1979). Stern (1946) stated that it is closely allied to the allopatric *P. anomala* L. from China (Xinjiang), Kazakstan, Mongolia, and Russia.

Paeonia veitchii differs from *P. anomala*, according to Stern (1946) and Pan (1979), in having several flowers on a stem instead of a solitary flower as in *P. anomala*. We examined some 175 specimens of *P. veitchii* and observed that the number of flowers on a stem varies greatly. At one extreme, there can be four fully developed flowers per stem. The majority of individuals of *P. veitchii* possess one to three flowers or underdeveloped flower buds per stem in addition to the terminal, fully developed flower. At the other extreme, only a solitary, terminal flower is fully developed without additional flower buds, the condition seen in the majority of individuals of *P. anomala*. Rarely in *P. anomala* may there be one or two underdeveloped flower buds in the upper leaf axils. In such cases, both conditions, i.e., with or without additional underdeveloped flower buds, may be observed within a single population of *P. anomala*. *Paeonia veitchii* is evidently different from *P. anomala* in the number of flowers per stem, but this character is continuously variable and bridges the two taxa.

There is also sometimes a difference in leaf indumentum. The adaxial leaf surface is hispid or hirsute along the veins in both *Paeonia anomala* and *P. veitchii*. The abaxial leaf surface is glabrous in *P. anomala* (at least in all the specimens examined for this study) and is also usually glabrous in *P. veitchii*, but in some individuals of *P. veitchii* the veins may be hispid or hirsute. For example, we examined 40 specimens of *P. veitchii* from populations in southern Gansu and found some plants with leaves hispid or hirsute along the veins abaxially, but more often with leaves glabrous abaxially. Among these same specimens, we also found that both character states occurred within the same population.

Both *Paeonia anomala* and *P. veitchii* are variable in carpel indumentum. Both species usually have hispid or hirsute carpels, rarely glabrous ones, and both species may exhibit the two character states within the same population. We therefore regard carpel indumentum as a character of little or no taxonomic value.

The two taxa are allopatrically distributed, with *Paeonia anomala* to the north and northwest of the Gobi Desert and *P. veitchii* to the south. On the basis of this disjunct distribution, one might argue in favor of separation at specific rank. However, the morphological differences between the two taxa are not clear cut, showing considerable intergrading especially in flower number per stem. Therefore, subspecific rank seems more appropriate. The diagnostic features of the two subspecies are summarized in Table 1.

Four varieties, in addition to the typical variety, have been recognized by various authors under

Table 1. Morphological comparison of the subspecies in *Paeonia anomala*.

Paeonia anomala	Subsp. *anomala*	Subsp. *veitchii*
Abaxial leaf surface	Glabrous	Usually glabrous, rarely hispid or hirsute along veins
Adaxial leaf surface	Hispid or hirsute along veins	Hispid or hirsute along veins
Fully developed flowers per stem	1	2 to 4, rarely 1
Additional underdeveloped flower buds per stem	Usually absent, rarely 1 or 2	Usually 1 to 3, rarely absent
Total flowers and buds per stem	Usually 1, rarely 2 or 3	Usually 2 to 4, rarely 1
Carpels	Hispid or hirsute, rarely glabrous	Hispid or hirsute, rarely glabrous
Distribution	China (N Xinjiang), NE Kazakstan, N Mongolia, Russia (NE European part, Siberia)	China (C & S Gansu, S Ningxia, E Qinghai, S Shaanxi, N Shanxi, W Sichuan, E Xizang)

Paeonia veitchii, two of them originally described at specific rank. They are discussed below. We do not consider formal taxonomic recognition to be appropriate for any of the four, and accordingly reduce them to synonymy under *P. anomala* subsp. *veitchii*.

First, we could find no significant differences between *Paeonia beresowskii* Komarov and *P. veitchii*. After studying the protologue (Komarov, 1921: 5–6) and the specimens from the type locality (Songpan County in Sichuan), we follow Stern (1946) and Fang (1958) in reducing it to the synonymy in *P. veitchii*.

Paeonia woodwardii, according to its protologue (Stern & Cox, 1930: 43), differs from *P. veitchii* in its smaller stature (ca. 30 cm tall, vs. up to 90 cm in *P. veitchii*) and longer, hispid hairs along the veins on both leaf surfaces. Stern (1946), followed by Fang (1958), recognized *P. woodwardii* as a variety under *P. veitchii*. However, as earlier mentioned, *P. veitchii* is variable in its leaf indumentum, usually having hairs only adaxially, but rarely also abaxially. We examined specimens from southern Gansu, including the type locality (Jone in Gansu) of *P. woodwardii*, and found both states of leaf indumentum. Therefore, we regard *P. woodwardii* as merely representing part of the specific variation found within *P. veitchii* and do not formally recognize it.

Paeonia veitchii var. *leiocarpa* W. T. Wang & S. H. Wang ex K. Y. Pan was distinguished in its protologue (Pan, 1979: 603) from typical *P. veitchii* only by its glabrous carpels. The majority of specimens examined by us from the type locality (Jinchuan County in Sichuan) have hispid carpels. Otherwise, those plants with glabrous carpels and those with hispid carpels generally resemble each other. As earlier mentioned, we attach little or no taxonomic value to carpel indumentum and therefore regard variety *leiocarpa* as a synonym of *P. veitchii*.

Regarding *Paeonia veitchii* var. *uniflora* K. Y. Pan, as earlier mentioned, individuals possessing a single flower on a stem, without additional underdeveloped flower buds, belong only to one extreme of a continuum of variation in flower number per stem. We therefore also reduce this variety to the synonymy of *P. veitchii*.

The name *Paeonia veitchii* var. *purpurea* Schipczinsky is invalid under Article 26.2 of the *Saint Louis Code* (Greuter et al., 2000) because it included the nomenclaturally typical element of *P. veitchii*. Schipczinsky's protologue (1921: 46) gave two varieties under the species name: variety "α." *purpurea* and variety "β." *beresowskii* (Komarov) Schipczinsky. For six other species in the same paper, Schipczinsky used "var. α. *typica*" (or "*tipica*" or "*genuina*") to indicate the nomenclaturally typical element; such names are also invalid under Article 24.3.

Regarding the actual type of *Paeonia veitchii*, Lynch's protologue (1909: 2) stated, "It is a native of the uplands around Tatien-lu [Kangding in Sichuan], a district in the far west of China, close to the Tibetan frontier, and is frequently found by the margins of thickets at an elevation of from 8,000 to 11,000 feet. It was introduced by Messrs. James Veitch & Sons through their collector, Mr. Wilson." There are two specimens at K labeled as Wilson collections for James Veitch & Sons from "Western China" at "8–10,000 ft.": *E. H. Wilson 3034* and *E. H. Wilson 3036*. These specimens are clearly part of the original material for *P. veitchii* and, in the absence of any other explicitly cited specimens in the protologue, either is eligible as the lectotype (Article 9.10). Number 3034 is the better of the two specimens, with a flower and a

fruiting head. The formal lectotype designation is made below.

Paeonia anomala subsp. **veitchii** (Lynch) D. Y. Hong & K. Y. Pan, comb. et stat. nov. Basionym: *Paeonia veitchii* Lynch, Gard. Chron, ser. 3, 46: 2, fig. 1. 1909. *Paeonia veitchii* var. *purpurea* Schipczinsky, Bot. Mater. Gerb. Glavn. Bot. Sada RSFSR 2: 46. 1921, nom. inval. TYPE: China. Sichuan: "Tatien-lu" [from protologue, i.e., Kangding], "8–10,000 ft." [from specimen], s.d., *E. H. Wilson (for James Veitch & Sons) 3034* (lectotype, selected here, K; isolectotype, PE).

Paeonia beresowskii Komarov, Bot. Mater. Gerb. Glavn. Bot. Sada RSFSR 2: 5. 15 Jan. 1921. *Paeonia veitchii* var. *beresowskii* (Komarov) Schipczinsky, Bot. Mater. Gerb. Glavn. Bot. Sada RSFSR 2: 46. 26 Mar. 1921. TYPE: China. Sichuan: "Sun-Pan-tin [Songpan County], circa p. Gui-chua," 9 June 1894, *M. Beresowski s.n.* (holotype, LE not seen).

Paeonia woodwardii Stern & Cox, in Cox, Pl. Introd. Farrer, 43. 1930. Syn. nov. *Paeonia veitchii* var. *woodwardii* (Stern & Cox) Stern, J. Roy. Hort. Soc. 68: 130. 1943. TYPE: China. Gansu: "Chuoni" [from protologue, i.e., Jone], "alps among rocks above above Satanee 7–8000 [ft.]" [from specimen], 15 May 1914, *R. Farrer 67* (holotype, E).

Paeonia veitchii var. *leiocarpa* W. T. Wang & S. H. Wang ex K. Y. Pan, Fl. Reipubl. Popularis Sin. 27: 603. 1979. Syn. nov. TYPE: China. Sichuan: Jinchuan County, Kasa Township, Yinchanggou, forest by stream, 2700 m, 26 Apr. 1958, *X. Li 77248* (holotype, PE).

Paeonia veitchii var. *uniflora* K. Y. Pan, Fl. Reipubl. Popularis Sin. 27: 603. 1979. Syn. nov. TYPE: China. Sichuan: Garzê County, Xiongjiling, 3600 m, mountain summit, bushes, 18 June 1974, *Qinghai-Xizang Expedition Vegetation Group 34* (holotype, PE).

Herbs perennial, 30–90 cm tall. Roots cylindric, thick, 1–2 cm diam., attenuate downward. Stem glabrous. Leaves biternate, sometimes leaflets decurrent at base; leaflets several times segmented; ultimate segments (37–)50–100(–180), dark green, linear or linear-lanceolate, 0.25–2 cm, abaxially usually glabrous, rarely hispid or hirsute along veins, adaxially hispid or hirsute along veins, apex acuminate. Flowers 1 to 4 per stem, terminal and axillary, 4.5–10 cm diam.; lateral flowers sometimes with a leaf below; bracts 2 or 3, leaflike, lanceolate, unequal, margin lobed or entire; 1 or 2 underdeveloped flower buds often also present in axils of distal leaves. Sepals 3 to 5, broadly ovate, 1.5–1.7 × 1–1.4 cm, apex usually caudate. Petals 6 to 9, purple-red, red, or pink, rarely nearly white, obovate, 2.5–4 × 1.5–3 cm, apex notched or entire. Filaments purple, 5–10 mm. Disc fleshy, enveloping only base of carpels. Carpels (1 or)2 or 3(to 5), hispid or hirsute, very rarely glabrous. Follicles ovoid-cylindric, 1–2.7 × 1–1.5 cm, hispid or hirsute. Seeds black, glossy, oblong-globose, ca. 6 × 5.5 mm.

Phenology. Flowering from late April to June in Sichuan, and from early June to the middle of July in Gansu and Qinghai. Fruits mature from August to early September.

Habitat. Relatively moist habitats: forests, grasslands at forest margins, scrub, or subalpine and alpine meadows with shrubs, from 1800 to 3900 m.

Distribution. Endemic to China, with a wide distribution: central and southern Gansu, southern Ningxia (Liupan Shan), eastern Qinghai, southern Shaanxi (Qin Ling), northern Shanxi (Wutai Shan), western Sichuan, and extreme eastern Xizang.

Additional specimens examined:

Paeonia anomala subsp. *anomala.* CHINA. **Xinjiang:** *T. H. Ying 1006* (PE), *T. H. Ying 1007* (PE), *T. H. Ying 1009* (PE), *T. H. Ying 1010* (PE), *T. H. Ying 1011* (PE), *T. H. Ying 1014* (PE), *T. H. Ying 1022* (PE).

Paeonia anomala subsp. *veitchii.* CHINA. **Gansu:** *Anonymous s.n.* (CPB), *Anonymous s.n.* (NWTC), *Anonymous s.n.* (NWTC), *Anonymous s.n* (PE), *Anonymous 84* (NWTC), *Anonymous 557* (PE), *J. L. Bai 8613* (NWTC), *Chen & Ju s.n.* (NWTC), *T. K. Fu 834* (PE), *Gansu Herbs Group s.n.* (NWTC), *K. S. Hao 604* (PE), *Y. Q. He 4516* (PE), *Y. Q. He 4915* (PE), *W. Y. Hsia 5707* (PE), *Huanghe Expedition 1689* (PE), *Huanghe Expedition 3183* (PE), *Huanghe Expedition 4655* (PE), *Huanghe Expedition 4735* (PE), *Jiang & Jin 386* (PE), *Lian & Chen 31* (NWTC), *Lian & Chen 72* (NWTC), *Lian, Wang et al. 79197* (NWTC), *X. F. Long 85* (NWTC), *J. F. Rock 12260* (PE), *J. F. Rock 12829* (PE), *J. F. Rock 13127* (PE), *South Gansu Grassland Expedition 681* (NWTC), *Taohe Expedition 3243* (PE), *J. Q. Wang 197* (NWTC), *Q. R. Wang 1869* (NWTC), *Q. R. Wang 7034* (NWTC), *Q. R. Wang 7270* (NWTC), *T. P. Wang 4594* (PE), *T. P. Wang 5343* (PE), *T. P. Wang 6944* (PE), *T. P. Wang 15240* (PE), *M. S. Yan 1843* (NWTC), *H. J. Zhou 708* (NWTC), *G. L. Zhu 80006* (NWTC), *G. L. Zhu 80077* (NWTC). **Ningxia:** *Y. W. Cui 10281* (PE), *Gansu First Team of Huanghe Expedition 2168* (PE), *K. M. Liou 5659* (PE). **Qinghai:** *Gansu-Qinghai Expedition 2493* (PE), *B. Z. Guo 6767* (HNWP), *B. Z. Guo 7010* (HNWP), *B. Z. Guo 7396* (HNWP), *B. Z. Guo 10186* (HNWP), *B. Z. Guo 10232* (HNWP), *Guo & He 9012* (HNWP), *Guo & Wang 6008* (HNWP), *Guo & Wang 6717* (HNWP), *Guo & Wang 25058* (HNWP), *Guo & Yang 9608* (HNWP), *K. S. Hao 779* (PE), *K. C. Kuan 77309* (PE), *Liang, Fan, Li et al. 378* (HNWP), *K. M. Liou 5970* (PE), *K. M. Liou 6019* (PE), *K. M. Liou 6044* (PE), *K. M. Liou 6178* (PE), *S. W. Liu 2115* (HNWP), *Liu & Luo 1040* (HNWP), *Z. Y. Qing 1218* (HNWP, PE), *P. C. Tsoong 8842* (PE), *S. X. Wang 1065* (HNWP), *W. Y. Wang 26771* (HNWP), *W. Y. Wang 26818* (HNWP), *W. Y. Wang 27060* (HNWP), *W. Y. Wang et al. 27347* (HNWP), *Wang & Zhou 19* (HNWP), *Wang & Zhou 198A* (HNWP), *Yu, Lu, Gu & Li 68* (PE), *G. Z. Zhang 5* (HNWP), *Z. H. Zhang et al. 97* (HNWP), *Z. H. Zhang et al. 414* (HNWP), *Z. H. Zhang et al. 4291* (HNWP), *Z. H. Zhang et al.*

4317 (HNWP), *Z. H. Zhang et al. 4320* (HNWP), *Zhang & Li 502* (HNWP), *S. X. Zhen 351* (PE), *L. H. Zhou 2528* (HNWP). **Shaanxi:** *K. J. Fu 4441* (PE), *Hong & Zhu PB85065* (PE), *W. Y. Hsia 4539* (PE), *W. Y. Hsia 4571* (PE), *Pharmaceutical Expedition 2019* (PE). **Shanxi:** *P. Licent 2022* (PE), *Shanxi Expedition 684* (PE), *Shanxi Expedition, Wang & Tian 594* (PE), *T. Tang 938* (PE). **Sichuan:** *Y. W. Cui 4348* (PE), *W. P. Fang 4213* (PE), *W. P. Fang 6037* (PE), *Z. He 12339* (PE), *He & Zhou 13338* (PE), *Hong, Luo & He H95034* (PE), *Hong & Zhong PB82105* (PE), *Hong & Zhu PB85019* (PE), *Hong & Zhu PB85040* (PE), *W. G. Hu 13050* (PE), *Hu & He 10088* (PE), *Hu & He 10373* (PE), *Hu & He 10463* (PE), *Hu & He 11173* (PE), *Huang, Luo & Jiang 730* (PE), *S. X. Jia 229* (PE), *S. Jiang 5768* (PE), *S. Jiang 8874* (PE), *S. Jiang 8930* (PE), *S. Jiang 8965* (PE), *S. Jiang 9082* (PE), *S. Jiang A-7162* (PE), *S. Jiang A-7275* (PE), *X. C. Jiang 36014* (PE), *X. C. Jiang 36433* (PE), *Jiang & Jin 2113* (PE), *Jiang & Xiong 34242* (PE), *Jiang & Xiong 34319* (PE), *Jiang & Xiong 35625* (PE), *P. X. Li 10100* (PE), *P. X. Li 10137* (PE), *P. X. Li 10143* (PE), *X. Li 70247* (PE), *X. Li 70441* (PE), *X. Li 70510* (PE), *X. Li 70685* (PE), *X. Li 70719* (PE), *X. Li 70867* (PE), *X. Li 70903* (PE), *X. Li 71029* (PE), *X. Li 71087* (PE), *X. Li 71196* (PE), *X. Li 71645* (PE), *X. Li 74842* (PE), *X. Li 74936* (PE), *Nanshui-Beidiao Expedition 2912* (PE), *Z. X. Qu 2792* (PE), *Sichuan-Econom. A59–1001* (PE), *Sichuan-Econom. A59–1208* (PE), *Sichuan-Econom. A59–2290* (PE), *Sichuan-Econom. A59–246* (PE), *Sichuan-Econom. A59–2554* (PE), *Sichuan-Econom. Ya-838* (PE), *Sichuan Plants Collection 905* (PE), *H. Smith 2499* (PE), *Z. P. Song 38544* (PE), *Z. P. Song 39107* (PE), *P. C. Tsoong 5004* (PE), *P. C. Tsoong 5024* (PE), *T. H. Tu 362* (PE), *T. H. Tu 4329* (PE), *F. T. Wang 22930* (PE), *West Sichuan Expedition, Kuan, Wang et al. 243* (PE), *West Sichuan Expedition, Kuan, Wang et al. 352* (PE), *West Sichuan Expedition, Kuan, Wang et al. 732* (PE), *J. S. Ying 3113* (PE), *J. S. Ying 3869* (PE), *J. S. Ying 4582* (PE), *J. S. Ying 4591*(PE), *T. T. Yü 2200* (PE), *T. T. Yü 6137* (PE), *Zhang & Lang 57* (PE), *Zhang & Ren 5572* (PE), *Zhang & Ren 6082* (PE), *Zhang & Ren 6322* (PE), *Zhang & Zhou 22092* (PE), *Zhang & Zhou 22155* (PE), *Zhang & Zhou 22675* (PE), *Zhang & Zhou 23742* (PE), *S. F. Zhu 20491* (PE). **Xizang [Tibet]:** *Qinghai-Xizang Expedition Vegetation Group 9893* (PE).

Acknowledgments. Our sincere gratitude is due to Peter H. Raven, Director of the Missouri Botanical Garden, for his continuous encouragement and help in our study on *Paeonia*. We also thank Li Qiaoling for typing the original manuscript, Sylvia M. Phillips and Mark F. Watson for checking type material at K and E, respectively, Michael G. Gilbert for checking literature at BM, the directors and curators of the herbaria CPB, E, HNWP, K, NWTC, and PE for allowing access to their collections, and Victoria C. Hollowell, editor of *Novon*, and two anonymous reviewers for their valuable suggestions on earlier versions of the manuscript.

Literature Cited

Anonymous. 1972. *Paeonia veitchii* Lynch. P. 654, fig. 1307 *in:* Iconographia Cormophytorum Sinicorum, 1. Science Press, Beijing.

Fang, W. P. 1958. Notes on Chinese paeonies. Acta Phytotax. Sin. 7: 297–323, pl. 61–63.

Greuter, W., J. McNeill, F. R. Barrie, H. M. Burdet, V. Demoulin, T. S. Filgueiras, D. H. Nicolson, P. C. Silva, J. E. Skog, P. Trehane, N. J. Turland & D. L. Hawksworth (editors). 2000. International Code of Botanical Nomenclature (Saint Louis Code). Regnum Veg. 138.

Komarov, V. L. 1921. Plantae novae chinenses. Bot. Mater. Gerb. Glavn. Bot. Sada RSFSR 2: 5–8.

Lynch R. I. 1909. New or noteworthy plants. *Paeonia veitchii* n. sp. Gard. Chron., ser. 3, 46: 2, fig. 1.

Pan, K. Y. 1979. *Paeonia* L. Pp. 37–59 *in:* Flora Reipublicae Popularis Sinicae, 27. Science Press, Beijing.

Schipczinsky, N. V. 1921. Kratkiy obzor roda *Paeonia* (Tourn.) L. Bot. Mater. Gerb. Glavn. Bot. Sada RSFSR 2: 41–47.

Stern, F. C. 1946. A Study of the genus *Paeonia*. Royal Horticultural Society, London.

——— & E. H. M. Cox. 1930. The Farrer-Purdom expedition to Kansu 1914–1915. Pp. 25–53 *in* E. H. M. Cox (editor), The Plant Introductions of Reginald Farrer. New Flora and Silva, London.